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L6: Entry 1 of 7

File: EPAB

Apr 22, 1999

PUB-NO: WO009918787A1

DOCUMENT-IDENTIFIER: WO 9918787 A1

TITLE: METHOD OF DISPERSING AN INSOLUBLE MATERIAL IN AQUEOUS SOLUTION AND AGRICULTURAL FORMULATION

PUBN-DATE: April 22, 1999

INVENTOR-INFORMATION:

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INT-CL (IPC): A01N 25/30; B01F 17/52

duplicate

Full	Title	Citation	Front	Review	Classification	Date	Reference
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☐ 2. Document ID: WO 9918786 A1

L6: Entry 2 of 7

File: EPAB

Apr 22, 1999

PUB-NO: WO009918786A1

DOCUMENT-IDENTIFIER: WO 9918786 A1

TITLE: METHOD AND COMPOSITION FOR DISPERSING AN INSOLUBLE MATERIAL IN AQUEOUS SOLUTION

PUBN-DATE: April 22, 1999

INVENTOR-INFORMATION:

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INT-CL (IPC): A01N 25/30; B01F 17/52

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Full	Title	Citation	Front	Review	Classification	Date	Reference
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TABLE 1-5-continued

Laminated structure	Light Surface Static				Heat sealant layer containing silica					
	Haz-	trans-	re-	decay	Heat sealant layer containing silica			Heat sealant layer containing alumina		
	iness (%)	missivity (%)	sistivity (Ω)	time (sec)	Peel strength (g/15 mm)	Peeling mode Condition 1	Peeling mode Condition 2	strength (g/15 mm)	Peeling mode Condition 1	Peeling mode Condition 2
Sample 16	25	85	10^7	0.1	600	Delamination	—	500	Delamination	—
Comp. sample 1	27	85	$10^{13} \leq$	0.1	600	Delamination	Cohesive failure	500	Delamination	Cohesive failure
Comp. sample 2	78	20	10^6	0.1	300	Cohesive failure	Separation	200	Cohesive failure	Separation
Comp. sample 3	25	90	$10^{13} \leq$	0.1	600	Delamination	Cohesive failure	500	Delamination	Cohesive failure

Peeling modes***

Cohesive failure: Internal breakage of the heat sealant layer

Delamination: Separation of the heat sealant layer and the intermediate layer

Separation: Separation of the heat sealant layer from the container

As is obvious from Table 1-5, Comparative samples 1 and 3 are unsatisfactory in electrical conductivity, and Comparative sample 2 is unsatisfactory in transparency.

SECOND EXAMPLE

Similarly to the samples of the first example, laminated structures in Samples 1 to 16 and Comparative samples 1 to

20 6 each having a multilayer construction of PET layer/adhesive layer/intermediate layer/heat sealant layer/bisammonium organic sulfur semiconductor layer by using combinations of materials shown in Table 1-6. Each of the materials for forming the heat sealant layer was prepared by mixing 120 parts by weight of silica (SiO_2) particles of 0.01 μm particle size and 100 parts by weight of the resin.

TABLE 1-6

Laminated structure	Intermediate layer				Heat sealant layer	Antistatic layer
	L.LDPE	S.B copolymer	Hydrogenated S.B copolymer	HIPS		
Sample 1	12	88	—	—	Polyester I	Provided
Sample 2	12	80	8	—	Polyester I	Provided
Sample 3	12	80	—	8	Polyester I	Provided
Sample 4	40	60	—	—	Polyester I	Provided
Sample 5	40	50	5	5	Polyester I	Provided
Sample 6	40	42	28	—	Polyester I	Provided
Sample 7	40	42	—	28	Polyester I	Provided
Sample 8	40	10	25	25	Polyester I	Provided
Sample 9	88	12	—	—	Polyester I	Provided
Sample 10	88	—	12	—	Polyester I	Provided
Sample 11	40	60	—	—	Acrylic resin	Provided
Sample 12	40	60	—	—	Ethylene vinyl acetate group	Provided
Sample 13	40	60	—	—	Acrylic-vinyl acetate group	Provided
Sample 14	40	60	—	—	Polyester-vinyl acetate group	Provided
Sample 15	40	60	—	—	Polystyrene group	Provided
Sample 16	40	60	—	—	Polypropylene group	Provided
Comp. sample 1	5	95	—	—	Polyester I	Provided
Comp. sample 2	95	5	—	—	Polyester I	Provided
Comp. sample 3	40	25	35	—	Polyester I	Provided
Comp. sample 4	40	5	—	55	Polyester I	Provided
Comp. sample 5	40	60	—	—	Polyester I	Not provided
Comp. sample 6	40	60	—	—	Polyester I	*

*Antistatic layer: Layer of an antistatic surface active agent

The haze, total light transmissivity, surface resistivity and static decay time of laminated structures in Samples 1 to 16 and Comparative samples 1 to 6 were measured under the same conditions as those applied to the measurement of the laminated structures in the first example. Covering structures formed by processing the laminated structures were heat-sealed to PVC carrier tapes as shown in FIG. 6 to measure the adhesive strength.

Measured results and peeling modes of peeling of the laminated structures are tabulated in Table 1-7.

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L6: Entry 3 of 7

File: EPAB

Apr 22, 1999

PUB-NO: WO009918785A1
DOCUMENT-IDENTIFIER: WO 9918785 A1
TITLE: METHOD AND COMPOSITION

PUBN-DATE: April 22, 1999

INVENTOR-INFORMATION:

NAME

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INT-CL (IPC): A01N 25/30; B01F 17/52

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☐ 4. Document ID: WO 9907673 A1

L6: Entry 4 of 7

File: EPAB

Feb 18, 1999

PUB-NO: WO009907673A1
DOCUMENT-IDENTIFIER: WO 9907673 A1
TITLE: ANIONIC ALKOXYLATE SURFACTANT

PUBN-DATE: February 18, 1999

INVENTOR-INFORMATION:

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INT-CL (IPC): C07C 305/04; C07C 305/06; C07C 305/10; C07F 9/09; C08G 65/48; C08G 65/32; C11D 1/29; C11D 1/34
EUR-CL (EPC): C07C305/10

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☐ 5. Document ID: WO 9511212 A1

L6: Entry 5 of 7

File: EPAB

Apr 27, 1995

TABLE 1-7

Laminated structure	Haziness (%)	Light transmissivity (%)	Surface resistivity (Ω)	Static decay time (sec)	Peel strength (g/15 mm)	Peeling mode Condition 1	Peeling mode Condition 2
Sample 1	25	90	10^7	0.01	1200	Delamination	Cohesive failure
Sample 2	29	85	10^7	0.01	1150	Delamination	Cohesive failure
Sample 3	29	84	10^7	0.01	1150	Delamination	Cohesive failure
Sample 4	25	92	10^7	0.01	650	Delamination	Cohesive failure
Sample 5	35	80	10^7	0.01	800	Delamination	Cohesive failure
Sample 6	36	75	10^7	0.01	800	Delamination	Cohesive failure
Sample 7	39	70	10^7	0.01	800	Delamination	Cohesive failure
Sample 8	45	65	10^7	0.01	820	Delamination	Cohesive failure
Sample 9	12	92	10^7	0.01	1100	Delamination	Cohesive failure
Sample 10	15	92	10^7	0.01	1100	Delamination	Cohesive failure
Sample 11	25	92	10^7	0.01	750	Delamination	Cohesive failure
Sample 12	29	90	10^7	0.01	450	Delamination	Cohesive failure
Sample 13	20	92	10^7	0.01	500	Delamination	Cohesive failure
Sample 14	18	92	10^7	0.01	550	Delamination	Cohesive failure
Sample 15	19	90	10^7	0.01	700	Delamination	Cohesive failure
Sample 16	25	85	10^7	0.01	700	Delamination	Cohesive failure
Comp. sample 1	18	90	10^7	0.01	1250	Delamination	Cohesive failure
Comp. sample 2	18	90	10^7	0.01	80	Separation	Separation
Comp. sample 3	27	85	10^7	0.01	700	Delamination	Cohesive failure
Comp. sample 4	55	60	10^7	0.01	700	Delamination	Cohesive failure
Comp. sample 5	55	92	$10^{13} \leq$	$2.0 \leq$	600	Delamination	Cohesive failure
Comp. sample 6	25	92	$10^{13} \leq$	10	600	Delamination	Cohesive failure

Peeling modes***

Cohesive failure: Internal breakage of the heat sealant layer

Delamination: Separation of the heat sealant layer and the intermediate layer

Separation: Separation of the heat sealant layer from the container

As is obvious from Table 1-7, the adhesive strength between Comparative sample 1 and the PVC carrier tape is excessively high, and the film forming property of Comparative sample 1 is unsatisfactory.

The adhesive strength of between Comparative sample 2 and the PVC carrier tape is excessively low, blocking occurred in the intermediate layer of Comparative sample 3. Comparative sample 4 is inferior in transparency, and Comparative samples 5 and 6 are unsatisfactory in conductivity.

THIRD EXAMPLE

Similarly to Sample 4 of the second embodiment, Samples were fabricated by sequentially forming an intermediate layer, a heat sealant layer and an antistatic layer on one surface of a PET film.

The following three antistatic agents were used.

Antistatic agent A:

"NYUEREGAN A" (cationic agent) (Nippon Yushi K.K.)

Antistatic agent B:

"ELCOM P3501" (Shokubai Kasei Kogyo K.K.)

Antistatic agent C:

"R321" (tin-doped UV setting type) (Sumitomo Semento K.K.)

Composition of Antireflection Coating Material

Magnesium fluoride:	30 parts by weight
Polyester resin:	20 parts by weight
("BAIRON" commercially available from Toyo-bo K.K., glass transition point: 50° C.)	
Solvent:	50 parts by weight
(toluene/methylketone = 1/1)	

The antistatic agent was applied to the other surface of the PET film by a gravure reverse process to form a 0.5 μ m thick antistatic layer, and then the antireflection coating material was applied to the antistatic layer by a gravure reverse process to form a 0.1 μ m thick antireflection film. Thus, laminated structures in Samples 1 to 4 were fabricated.

The surface resistivity and static decay time of Samples 1 to 4 were measured by the same method as those applied to measuring the characteristics of the samples of the first example. Measured results are tabulated in Table 1-8.

TABLE 1-8

Covering structure	antistatic agent	Antireflection film	Surface resistivity (Ω)	Static decay time (sec)	Reflection from the surface
Sample 1	A	Provided	10^9	0.1	No reflection
Sample 2	B	Provided	10^9	0.1	No reflection
Sample 3	C	Provided	10^8	0.1	No reflection
Sample 4	C	Not provided	10^8	0.1	No reflection

As is obvious from Table 1-8, the antistatic performance of Samples 1 to 4 provided with the antistatic layer was satisfactory. The antireflection films of Samples 1 to 3 prevented surface reflection, irregular reflection and the reflection of a light source on the laminated structures.

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TITLE: ALKOXYLATION PROCESS

PUBN-DATE: April 27, 1995

INVENTOR-INFORMATION:

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EUR-CL (EPC): B01J023/10; B01J037/02, C07C041/03

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☐ 6. Document ID: WO 9322266 A1

L6: Entry 6 of 7

File: EPAB

Nov 11, 1993

PUB-NO: WO009322266A1
DOCUMENT-IDENTIFIER: WO 9322266 A1
TITLE: ALKOXYLATION PROCESS

PUBN-DATE: November 11, 1993

INVENTOR-INFORMATION:

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EUR-CL (EPC): C07C041/03; C07B041/04

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☐ 7. Document ID: EP 102707 A1

L6: Entry 7 of 7

File: EPAB

Mar 14, 1984

FOURTH EXAMPLE

Similarly to the samples of the first example, laminated structures in Samples 1 to 16 and Comparative samples 1 and 2 each having a multilayer construction of biaxially oriented PET layer/adhesive layer/intermediate layer/heat sealant layer/bisammonium organic sulfur semiconductor layer. The composition of the resin for forming intermediate layers was 40% L-LDPE and 60% S-B copolymer.

Similarly to the samples of the first example, the laminated structures thus fabricated were heat-sealed to PVC carriers with a heat-sealing bar under heat-sealing conditions of 150° C., 0.5 Sec and 3.0 kgf/cm². The laminated structures heat-sealed to the PVC carrier tapes were subjected to peel tests to measure its adhesive strength and to determine zip-up.

TABLE 1-9

	Heat sealant layer	Substance	Additive		
			Particle size	Content (%)	Zip-up (g/2 mm)
Sample 1	Urethane-vinyl chloride/acetate (40%:60%)	Silica	0.01 μ m	100	15
Sample 2	Urethane-vinyl chloride/acetate (40%:60%)	Al ₂ O ₃	0.02 μ m	100	20
Sample 3	Urethane-vinyl chloride/acetate (40%:60%)	Barium sulfide	0.1 μ m	100	20
Sample 4	Urethane-vinyl chloride/acetate (40%:60%)	Acrylate beads	10 μ m	100	35
Sample 5	Urethane-vinyl chloride/acetate (40%:60%)	Polyethylene particles	1 μ m	100	30
Sample 6	Urethane-vinyl chloride/acetate (40%:60%)	Polyester beads	20 μ m	100	40
Sample 7	Urethane-vinyl chloride/acetate (40%:60%)	Polyester beads	5 μ m	100	30
Sample 8	Urethane-vinyl chloride/acetate (40%:60%)	Silica	0.01 μ m	1	50
Sample 9	Urethane-vinyl chloride/acetate (40%:60%)	Silica	0.01 μ m	200	10
Sample 10	Vinyl chloride/acetate	Silica	0.01 μ m	100	20
Sample 11	Polyester I	Silica	0.01 μ m	100	15
Sample 12	Polyacrylate	Silica	0.01 μ m	100	10
Sample 13	Polystyrene	Silica	0.01 μ m	100	20
Sample 14	Polypropylene	Silica	0.01 μ m	100	40
Sample 15	Ethylene-vinyl acetate	Silica	0.01 μ m	100	10
Sample 16	Polyacrylate-vinyl chloride/acetate (40%:60%)	Silica	0.01 μ m	100	30
Comp. sample 1	Urethane-vinyl chloride/acetate (40%:60%)	Silica	0.01 μ m	0.5	60
Comp. sample 2	Urethane-vinyl chloride/acetate (40%:60%)	Silica	0.01 μ m	220	5

(*) Parts by weight per 100 parts by weight of resin

As shown in Table 1-9, zip-ups for Samples 1 to 16 were as small as 50 g/2 mm or below. The zip-up for Comparative sample 1 was greater than 50 g/2 mm. Although the zip-up for Comparative sample 2 is small, the transparency of Comparative sample 2 was unsatisfactory.

As is apparent from the foregoing description, according to the present invention, the antistatic layer of the antistatic material containing the bisammonium organic sulfur semiconductor as a principal component is formed on one surface of the heat sealant layer to provide the laminated structure with a satisfactory antistatic property which is not affected by moisture, and the oriented resin layer is formed on the other surface of the heat sealant layer. The covering structure and the pouch formed by processing the laminated structure of the present invention have an excellent antistatic characteristic and are capable of preventing the qualitative deterioration and the breakage of the contents by static electricity. When peeling the covering structure from a synthetic resin container, the laminated structure is delaminated between the oriented resin layer and the heat sealant layer or the heat sealant layer is broken internally due to cohesive failure. Thus, the high adhesion of the heat sealant layer can be maintained, and the covering structure can properly be peeled off from the synthetic resin container. Therefore, conditions for heat-sealing the covering structure to the

synthetic resin container can easily be determined. Since the antistatic layer is transparent, the visibility of the contents of the synthetic resin container and the pouch is satisfactory.

Second Embodiment

A second embodiment of the present invention will be described hereinafter with reference to the accompanying drawings.

FIG. 14 is a typical sectional view of an example of a laminated structure (covering structure) of the present invention. Referring to FIG. 14, a laminated structure 1 of the present invention is fabricated by sequentially stacking a heat-resistant base layer 4, an adhesive layer 6, an intermediate layer 5 and a heat sealant layer 2 in that order.

The laminated structure (covering structure) of the present invention has an initial impact strength P as measured by a loop stiffness test method in the range of 5 g to 20 g, and a

stiffness f not higher than the initial impact strength P and meeting expressions: $f = -at + b$ and $0 \leq a \leq 0.1$, where a and b are constants, and t ($t \leq 3$ min) is time elapsed after the start of measurement of stiffness f.

In the loop stiffness test method, a 25 mm wide sample is looped in a loop length of 62 mm under a tension of 20 g, the sample is pushed in at a pushing speed of 3.5 mm/sec by a distance of 5 mm. The diameter of the surface of a pushing jig in contact with the sample is 25.4 mm.

The initial impact strength P represents the resilience of the loop-shaped laminated structure (covering structure) against an external force applied to the laminated structure. The stiffness f represents the restoring force of a pushed loop-shaped laminated structure (covering structure) and is equal to or lower than the initial impact strength P. A laminated structure having a high initial impact strength P and a high stiffness f is highly firm. If the stiffness f is higher than the initial impact strength P, the laminated structure (covering structure) is excessively firm, is difficult to bend and difficult to peel off.

The stiffness f varies in proportion to time t elapsed after the start of measurement as expressed by the foregoing expression. If the proportional constant a is 0.1 or above, the stiffness f decreases sharply with time t, which signifies that the laminated structure (covering structure) has a low restor-

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TITLE: Process for production of sterically stabilised wholly non-charged aqueous polymer dispersions.

PUBN-DATE: March 14, 1984

INVENTOR-INFORMATION:

NAME

DAVIES, STEPHEN PARRY

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COUNTRY

INT-CL (IPC): C08F 2/16; C08F 4/04

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ing force and unable to restore its original shape when depressed by an external force. Such a laminated structure (covering structure) is infirm and the zip-up will exceed a standard upper limit zip-up of 50 g/2 mm even if $5 \text{ g} \leq P \leq 20 \text{ g}$.

A laminated structure (covering structure) having an initial impact strength P below 5 g has a low resilience against an external force and is infirm. Therefore, the zip-up exceeds the upper limit of 50 g/2 mm. A laminated structure (covering structure) having an initial impact strength P exceeding 20 g has an excessively high rigidity, is difficult to bend and difficult to peel from a synthetic resin container. In some cases, a laminated structure (covering structure) having an initial impact strength P exceeding 20 g is excessively thick, difficult to heat-seal at a low temperature.

The component layers of the laminated structure (covering structure) 1 of the present invention will be described hereinafter.

(1) Heat-resistant Base Layer 4

The heat-resistant base layer 4 may be a uniaxially oriented or biaxially oriented film of a polyester resin, such as polyethylene terephthalate (PET) or polyethylene naphthalate (PEN), a polyolefin resin, such as polypropylene, a polyamide resin, such as nylon, a polycarbonate, a polyimide (PI), polyphenylene sulfide (PPS), polyarylate (PA), polyester ether (PEE), polyether ether ketone (PEEK), polyether imide (PEI), polyphenylene sulfide (PPS), polyamides (PAI), any one of all aromatic polyamides (APA), polyparabanic acid resin (PPA), polyoxadiazole (POD), polyhydantoin (PHY) or such. The heat-resistant base layer provides the laminated structure (covering structure) with a heat-resistant property. The thickness of the heat-resistant layer may be determined in compliance with the use of the laminated structure. For example, the thickness of the heat-resistant base layer is in the range of about 12 to about 50 μm .

In the laminated structure 1 shown in FIG. 14, the surface of the heat-resistant base layer 4 on which the adhesive layer 6 is formed may be finished by a surface treatment, such as a corona discharge treatment, a plasma treatment or a sandblasting treatment, to improve the adhesion between the heat-resistant base layer 4 and the adhesive layer 6, if necessary. The same surface of the heat-resistant base layer 4 may be processed by an antistatic treatment, if necessary.

(2) Adhesive Layer 6

The adhesive layer 6 may be a layer of a low-density polyethylene resin, an ethylene- α -olefin copolymer of a density in the range of 0.915 to 0.940 g/cm³, a polyethylene-vinyl acetate copolymer, an ionomer, polypropylene, an ethylene-methacrylic acid copolymer, an ethylene-acrylic acid copolymer or a denatured substance, such as a polyolefin resin, polyethylene imine resin, a polybutadiene resin, an organic titanium compound, an isocyanate resin, a polyester urethane resin or a polyether urethane resin, obtained by denaturing any one of the foregoing substances.

Preferably, the adhesive layer 6 is formed of a two-part adhesive, which is capable of enhancing the stiffness of the laminated structure 1, has heat-resistant adhesion, is easy to manufacture and to process and capable of hardening the resin at a low temperature in the range of 30 to 40° C.

Suitable materials as the resin, i.e., the main part, of the two-part adhesive are a polyesterpolyol synthesized from a diol, such as ethylene glycol, diethylene glycol, dipropylene glycol, 1,4-butanediol, 1,6-hexanediol or neopentyl glycol, and a dibasic acid, such as adipic acid, azelaic acid, sebacic acid, isophthalic acid, or terephthalic acid, denatured polyester polyol, a polyether polyol, such as polyethylene glycol,

diethylene glycol, polyoxypolypropylene glycol or polytetramethylene ether glycol, denatured polyether polyol, and a low molecular weight polyol, such as ethylene glycol, diethylene glycol, dipropylene glycol, 1,4-butanediol, 1,6-hexanediol, neopentyl glycol or trimethylolpropane.

Suitable materials as the accelerator of the two-part adhesive are a urethane prepolymer produced by mixing an isocyanate monomer, such as tolylenediisocyanate, diphenylmethane diisocyanate, hexamethylene diisocyanate, isohexanediol diisocyanate, tris(isocyanate phenyl) or methane-tris(isocyanate phenyl) thiophosphate, and trimethylol propane, and denatured isocyanates such as hexamethylene diisocyanate and diisocyanate trimer.

When forming the adhesive layer 6 with the two-part adhesive supplied in such a resin and such an accelerator, it is preferable that the resin-to-accelerator mixing ratio is greater than the ordinary resin-to-accelerator mixing ratio to form an adhesive layer capable of enhancing the stiffness of the laminated structure 1. More concretely, a desirable resin-to-accelerator mixing ratio is in the range of 100:10 to 100:70. If the resin-to-accelerator mixing ratio is large, the crosslinking density of the adhesive layer 3 increases and, consequently, an adhesive layer having a high rigidity and a large Young's modulus is formed to enhance the stiffness of the laminated structure. If the resin-to-accelerator ratio is increased beyond the upper limit of the foregoing range of resin-to-accelerator ratio, there is a tendency that the crosslinking density becomes excessively large, the cohesion of the adhesive layer increases and the adhesion of the adhesive layer decreases.

A desirable thickness of the adhesive layer 6 is in the range of 5 to 80 μm . The adhesive layer 3 may be formed on a film forming the heat-resistant base layer by coating or extrusion, and the intermediate layer 4 may be laminated to the adhesive layer 3 by dry lamination or extrusion lamination.

The adhesive layer 6 may contain 1 to 300 parts by weight of particles, such as inorganic particles, organic particles or organic spherical beads, per 100 parts by weight of a thermoplastic resin to secure a high stiffness and to reduce zip-up. The effect of the particles is insufficient if the particle content of the adhesive layer 6 is less than 1 part by weight per 100 parts by weight of the thermoplastic resin. The adhesive layer 6 is unable to secure desirable transparency, which will be described later, if the particle content is greater than 300 parts by weight per 100 parts by weight of the thermoplastic resin. The material and the particle size of the inorganic particles, the organic particle or the organic spherical beads are similar to those of the inorganic particles, the organic particle or the organic spherical beads to be contained in the intermediate layer 4, which will be described later.

(3) Intermediate Layer 5

The intermediate layer 5 of the laminated structure 1 of the present invention may be of either a single-layer construction or a multilayer construction, and may be similar to the intermediate layer of the laminated structure in the first embodiment.

Preferably, the intermediate layer 5 contains 1 to 300 parts by weight of particles, such as inorganic particles, organic particles or organic spherical beads per 100 parts by weight of a thermoplastic resin to secure stiffness. The effect of the particles is insufficient if the particle content of the intermediate layer 5 is less than 1 part by weight per 100 parts by weight of the thermoplastic resin. The intermediate layer 5 is unable to secure desirable transparency if the particle content is greater than 300 parts by weight per 100 parts by

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L-8 D.H. Parris

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L8: Entry 1 of 3

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Apr 22, 1999

PUB-NO: WO009918787A1

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TITLE: METHOD OF DISPERSING AN INSOLUBLE MATERIAL IN AQUEOUS SOLUTION AND AGRICULTURAL FORMULATION

PUBN-DATE: April 22, 1999

INVENTOR-INFORMATION:

NAME

KIRBY, ANDREW FRANCIS

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Full	Title	Citation	Front	Review	Classification	Date	Reference
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☐ 2. Document ID: WO 9918786 A1

L8: Entry 2 of 3

File: EPAB

Apr 22, 1999

PUB-NO: WO009918786A1

DOCUMENT-IDENTIFIER: WO 9918786 A1

TITLE: METHOD AND COMPOSITION FOR DISPERSING AN INSOLUBLE MATERIAL IN AQUEOUS SOLUTION

PUBN-DATE: April 22, 1999

INVENTOR-INFORMATION:

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KIRBY, ANDREW FRANCIS

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GLASS-FIBER-REINFORCED STABILIZED POLYAMIDE MOLDING COMPOSITIONS

This invention relates to a stabilized glass-fiber-reinforced copolyamide of adipic acid, terephthalic acid and hexamethylenediamine which shows high resistance to the effect of chemicals at elevated temperatures.

Glass-fiber-reinforced polyamides are distinguished from unreinforced polyamides by a higher deflection temperature and by improved tensile strength, rigidity and hardness. However, the higher deflection temperature cannot always be fully utilized because the polyamide can be damaged at the high processing temperatures required for the glass-fiber-reinforced polyamides and where the moldings are used for prolonged periods at elevated temperatures. For this reason, glass-fiber-reinforced products are frequently stabilized. The effect of chemicals can cause additional damage to the polyamide. A limit is thus imposed on the use of polyamides at elevated temperatures as a starting material for the production of such articles as pipes, tubes, storage tanks for hot liquids in industrial plants or for the production of radiator tanks for motor vehicles. It is not possible at the present time further to increase the temperature of the cooling fluid without damage to the cooling system. The proposals hitherto put forward for improving polyamides are unsatisfactory. Although, according to EP-A-0 129 974, the resistance of glass-fiber-reinforced polyamide-66, polyamide-6 or polyamide-610 to chemicals is increased somewhat by addition of olefin copolymers, the ability of these polyamides to withstand stresses for prolonged periods at elevated temperatures is not improved by this measure. DE-A-2 927 018 describes a glass-fiber-reinforced polyamide-66 in which part of the adipic acid is replaced by terephthalic acid. It is possible in this way to obtain improved flow behavior during extrusion and to eliminate the need for post-calcination. Although, according to this publication, the resistance of the copolyamides to chemicals and to temperature are favorable, there is no indication of an improvement in the deflection temperature of the polyamides under load. On the contrary, the lower melting point of the copolyamide by comparison with polyamide-66 rather suggests a reduction in the deflection temperature under load. Improved polyamides optionally reinforced with glass fibers are already known from DE-A-34 07 492.

The object of the present invention is to provide glass-fiber-reinforced polyamides which satisfy the increased requirements.

The present invention relates to stabilized polyamide molding compositions essentially containing the polycondensation product of adipic acid, terephthalic acid and hexamethylenediamine as polyamide, the molding compositions being reinforced with glass fibers and containing a mixture of copper-, halogen- and phosphorus-containing compounds as stabilizer.

Particularly preferred polyamides are the copolyamides known from DE-A-3 407 492.

Preferred copolyamides generally contain from 30 to 45% by weight and preferably from 37 to 42% by weight of units of polyhexamethylene terephthalamide and from 55 to 70% by weight and preferably from 58 to 63% by weight of units of polyhexamethylene adipamide according to DE-A-3 407 492.

The copolyamides according to the invention may contain additional polyamide-forming components by up to 10% by weight. Isophthalic acid in particular may be used as an additional acid component while hexamethylene diamine in particular may be used as an additional diamine component. Other diamines are the trimethyl hexamethylene diamines or the 4,4'-diaminodicyclohexylmethanes.

Preferred copolyamides of this type consist of at least 30% by weight, preferably 30 to 51.5% per weight of units of hexamethylene adipamide, 48.5 to 60% by weight and preferably 48.5 to 55% by weight of units of hexamethylene terephthalamide and up to 10.0% by weight and preferably up to 15.0% by weight of units of hexamethylene isophthalamide. They are described in DE-A 3 506 656.

The polyamides generally contain from 10 to 40% by weight and preferably from 15 to 35% by weight of fibers of standard commercially obtainable, sized, alkali-free glass. They have a diameter of generally from 8 to 15 μ m and, in general, a maximum fiber length distribution of 20 to 600 μ m and preferably 40 to 350 μ m.

Suitable stabilizers are preferably phosphines and/or phosphites and copper compounds, preferably in combination with alkali halogenides. Preferred stabilizers are the combinations of copper-containing compounds with alkali halides and phosphorus compounds known from DE-A-1 245 591. Suitable copper-containing compounds are, in particular, copper(I) halides, such as copper iodide and copper bromide. Preferred alkali halides are, in particular, lithium, sodium and potassium bromides and the corresponding iodides. Preferred phosphorus compounds are triaryl- or tri(alkylaryl)-phosphines such as tri-n-butyl-phosphine or phenyldimethyl phosphine, more especially triphenyl phosphine. Phosphites, as known in the state of the art as stabilizers, are also usable.

The stabilizer mixture is generally present in quantities of from 0.01 to 2.5% by weight, preferably in quantities of from 0.1 to 1.5% by weight and more preferably in quantities of from 0.1 to 1.0% by weight, based on the mixture.

UV absorbers or other stabilizers, for example phenolic antioxidants, (cyclo)aliphatic, sterically hindered amines or aromatic mono-, di- or polyamines, may be additionally added in quantities of from 0.2 to 2.0% by weight and preferably in quantities of from 0.25 to 1.0% by weight.

Phenols, aromatic (poly)amines and, optionally, UV absorbers may be additionally added in quantities of from 0.2 to 2.0% by weight and preferably in quantities of from 0.25 to 1.0% by weight.

The mixtures are prepared in standard commercially available machines by directly processing a uniform mixture of the copolyamide, the glass fibers and the stabilizers, which may optionally be used in the form of a concentrate, to form moldings. However, it is of considerably greater advantage to mix the components in the melt, for example in a twin-screw extruder, and to process the resulting granulate into moldings.

The products according to the invention may contain the usual auxiliaries and additives, for example lubricants and mold release agents, nucleating agents, flameproofing agents and other fillers. Suitable fillers are glass microbeads, chalk, quartz, such as novaculite, silicates, such as asbestos, feldspar, mica, talcum, wollastonite and also kaolin in calcined and non-calcined

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L8: Entry 3 of 3

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TITLE: METHOD AND COMPOSITION

PUBN-DATE: April 22, 1999

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form. Other suitable additives include dyes and pigments, high-impact modifiers, for example based on copolymers of ethylene or grafted rubber latices, for example on polybutadiene or poly(meth)acrylate. High-impact modifiers such as these are described, for example, in DE-A-2 622 973, EP-A-1245, EP-A-83 446. The polyamides according to the invention may be processed without difficulty in standard commercially available machines. They may be processed into moldings for technical apparatus, for machine construction and the automotive industry, which come into contact with hot chemicals, more especially radiator tanks.

EXAMPLE 1

68.4 parts by weight copolyamide of adipic acid, terephthalic acid and hexamethylenediamine, 30 parts by weight sized glass fibers of E-glass (Silenka 8041), 1.4 parts by weight of a stabilizer mixture of Cu₂KL₂ triphenyl phosphine according to DE-A-1 245 591 in the form of a 10% concentrate in PA 66 and 0.2 part by weight of a mold release agent (ester wax of ethylene glycol with monomeric acids) are compounded in a Werner & Pfleiderer Type ZSK 32 twin-screw extruder at a melt temperature of 304° C. and at a throughput of 10 to 15 kg/h.

The copolyamide contains 60% by weight of units of poly(hexamethylene adipamide) and 40% by weight of units of poly(hexamethylene terephthalamide). It was produced in accordance with DE-A-3 407 492. The relative viscosity of the copolyamide, as measured on a 1% solution in m-cresol at 25° C. in an Ubbelohde viscometer, is 3.1. Test specimens produced from the reinforced polyamide are stored in a mixture of ethylene glycol and water (mixing ratio 1:1 parts by weight) in an autoclave at 120° C. Samples are taken after various times and are used to determine impact strength in accordance with DIN 53 453 and bending modulus in accordance with DIN 53 457. The results are shown in the Table.

40

As Example 1, but with 2.8 parts by weight of the stabilizer mixture.

EXAMPLE 2

As Example 1, but with 0.3 part by weight of the stabilizer mixture (no concentrate in polyamide).

EXAMPLE 3

As Example 1, but with storage at 130° C.

EXAMPLE 4

As Example 1, but with storage at 140° C.

EXAMPLE 5

As Example 1, but without any addition of stabilizer

COMPARISON EXAMPLE 1

The following Comparison Examples were carried out with polyamide-66 in accordance with Example 1. The relative viscosity of the polyamide-66 was 3.0 and the temperature of the melt during compounding 286° C.

COMPARISON EXAMPLE 2

Without any addition of stabilizer, storage at 120° C.

COMPARISON EXAMPLE 3

The stabilizer added was the same as in Example 3.

COMPARISON EXAMPLE 4

The stabilizer added was the same as in Example 1, storage at 130° C.

COMPARISON EXAMPLE 5

The stabilizer added was the same as in Example 1, storage at 140° C.

The time elapsing before cracks began to form is shown in the following:

Example 4: a few cracks after 35 days

Example 5: after 25 days

Comparison Example 2: after 16 days

Comparison Example 4: after 1 day

Comparison Example 5: after 1 day

TABLE

Storage at °C	Fresh injection from molding	2	10	21	26	35	Example 1		Example 2		Example 3		Comparison Example 1		Comparison Example 2		Comparison Example 3		Comparison Example 4	
							Impact strength E-modulus (MPa)	(kJ/m ²)	Impact strength E-modulus (MPa)	(kJ/m ²)	Impact strength E-modulus (MPa)	(kJ/m ²)	Impact strength E-modulus (MPa)	(kJ/m ²)	Impact strength E-modulus (MPa)	(kJ/m ²)	Impact strength E-modulus (MPa)	(kJ/m ²)	Impact strength E-modulus (MPa)	(kJ/m ²)
120		37	73	59	49	46	3030	3077	3030	51	3062	53	3385	30	2158	44	4328	4254	33	120
120		42	7916	2942	77	66	3045	3045	3062	51	3062	53	3385	30	2158	44	4328	4254	33	120
120		44	8129	3086	77	63	3355	3355	3385	53	3385	53	3385	30	2158	44	4328	4254	33	120
120		31	6413	1947	86	55	39	2042	2158	30	2158	3385	3385	30	2158	44	4328	4254	33	120
120		47	68	57	46	44	4328	4254	44	4328	4254	4254	4254	44	4328	4254	4254	4254	4254	120
120		49	69	55	43	40	4328	4254	40	4328	4254	4254	4254	40	4328	4254	4254	4254	4254	120
120		46	96	67	46	31														120

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☐ 1. Document ID: US 6248695 B1

L5: Entry 1 of 8

File: USPT

Jun 19, 2001

US-PAT-NO: 6248695

DOCUMENT-IDENTIFIER: US 6248695 B1

TITLE: Herbicidal compositions

DATE-ISSUED: June 19, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Griffiths; Paul Leslie	Maribyrnong			AUX
Kirby; Andrew Francis	Footscray			AUX
Tonner; Stephen Patrick	Moonee Ponds			AUX

US-CL-CURRENT: 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWIC	Draw Desc	Image
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☐ 2. Document ID: US 5783692 A

L5: Entry 2 of 8

File: USPT

Jul 21, 1998

US-PAT-NO: 5783692

DOCUMENT-IDENTIFIER: US 5783692 A

TITLE: Alkyl polysaccharide derivatives and compositions

DATE-ISSUED: July 21, 1998

INVENTOR-INFORMATION:

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Moody; Keith	Watsonia North			AUX

US-CL-CURRENT: 536/123.1; 424/405, 424/DIG.8, 536/120

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWIC	Draw Desc	Image
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☐ 3. Document ID: WO 9918787 A1

L5: Entry 3 of 8

File: EPAB

Apr 22, 1999

α -olefin copolymer is less than 0.915 g/cm³ or greater than 0.940 g/cm³, the film forming capability of a combination of the ethylene- α -olefin copolymer and a styrene-butadiene block copolymer is unsatisfactory and the intermediate layer 25 cannot satisfactorily be formed.

A film of a styrene-butadiene block copolymer for forming the intermediate layer 25 has an excessive tackiness and is difficult to handle if the styrene content of the styrene-butadiene block copolymer is less than 50% by weight, and the adhesion of the film with the heat sealant layer 22 at a low temperature is not satisfactory if the styrene content of the styrene-butadiene block copolymer is greater than 90% by weight.

The mixing ratio between the ethylene- α -olefin copolymer and the styrene-butadiene block copolymer in the film forming the intermediate layer 25 affect greatly the adhesive strength between a synthetic resin container and the laminated structure (covering structure) 21 heat-sealed to the synthetic resin container, and the transparency of the covering structure 21. The mixing ratio between the ethylene- α -olefin copolymer and the styrene-butadiene block copolymer of the material for forming the intermediate layer 25 according to the present invention is 10 to 90% by weight of an ethylene- α -olefin copolymer to 90 to 10% by weight of a styrene-butadiene block copolymer. The film forming ability of the material for forming the intermediate layer 25 is low and the transparency of the same material is not satisfactory if the ethylene- α -olefin copolymer content is less than 10% by weight and the styrene-butadiene block copolymer content is greater than 90% by weight. The adhesion of the intermediate layer 25 with the heat sealant layer 22 is insufficient and the adhesive strength between the laminated structure (covering structure) 21 and the synthetic resin container is lower than an appropriate adhesive strength if the ethylene- α -olefin copolymer content is greater than 90% by weight and the styrene-butadiene block copolymer content is less than 10% by weight.

When forming the intermediate layer 25 of four kinds of resins including a hydrogenated styrene-butadiene copolymer and a high-impact polystyrene resin, it is preferable to add 0 to 30 parts by weight of hydrogenated styrene-butadiene block copolymer containing 10 to 50% by weight of styrene and 90 to 50% by weight of butadiene, and 0 to 50 parts by weight of a high-impact polystyrene resin to 100 parts by weight of a resin composition containing 10 to 90% by weight of the ethylene- α -olefin copolymer and 90 to 10% by weight of the styrene-butadiene block copolymer.

A hydrogenated styrene-butadiene block copolymer content greater than 30 parts by weight is undesirable because the blocking resistance of a film formed of the resin composition having a hydrogenated styrene-butadiene block copolymer content greater than 30 parts by weight is insufficient. If an additive added to the styrene-butadiene block copolymer for hydrogenation does not act properly, the styrene-butadiene block copolymer has a large butadiene content and is liable to be oxidized. If the intermediate layer 25 is formed of such a material, a gel is liable to form.

If an anhydride is added as an additive to the film forming material, it is difficult to form a film in a satisfactory accuracy.

It is not desirable that the high-impact polystyrene content of the film forming material is 50 parts by weight because the transparency of the intermediate layer 25 is unsatisfactory if the intermediate layer 25 is formed of a film forming material of a high-impact polystyrene content exceeding 50 parts by weight.

The intermediate layer may be formed of a resin composition of three kinds of resins, such as a resin composition

containing 100 parts by weight of a resin composition containing 10 to 90% by weight of an ethylene- α -olefin copolymer and 90 to 10% by weight of a styrene-butadiene block copolymer, and 0 to 30 parts by weight of a hydrogenated styrene-butadiene block copolymer. It is also possible to form the intermediate layer 25 of a resin composition containing 100 parts by weight of a resin composition containing 10 to 90% by weight of an ethylene- α -olefin copolymer and 90 to 10% by weight of a styrene-butadiene block copolymer, and 0 to 50 parts by weight of a high-impact polystyrene.

It is further possible to form the intermediate layer 25 of a single-layer construction of a resin composition containing 10 to 90 parts by weight of an ethylene- α -olefin copolymer of a density in the range of 0.915 to 0.940 g/cm³, and 90 to 10 parts by weight of styrene-butadiene block copolymer containing 50 to 90% by weight of styrene and 50 to 10% by weight of butadiene.

The tackiness of the film forming the intermediate layer 25 increases and blocking is liable to occur if the styrene content of the styrene-butadiene block copolymer is less than 50% by weight. The adhesion of the intermediate layer 25 with the heat sealant layer 22 is insufficient if the styrene content of the styrene-butadiene block copolymer exceeds 90% by weight. The mixing ratio between the ethylene- α -olefin copolymer and the styrene-butadiene block copolymer in the film forming the intermediate layer 25 affect greatly the adhesive strength between a synthetic resin container and the laminated structure (covering structure) 21 heat-sealed to the synthetic resin container, and the transparency of the intermediate layer 25. If the ethylene- α -olefin copolymer content is less than 10% by weight and the styrene-butadiene block copolymer content is greater than 90% by weight, it is difficult to form a film for the intermediate layer 25 and the transparency of the covering structure is not satisfactory. If the ethylene- α -olefin copolymer content is greater than 90% by weight and the styrene-butadiene block copolymer content is less than 10% by weight, the adhesion of the intermediate layer 25 with the heat sealant layer 22 is excessively low and the adhesive strength between the laminated structure (covering structure) 21 and the synthetic resin container is lower than an appropriate adhesive strength.

According to the present invention, the intermediate layer 25 of a single-layer construction may be formed of a resin composition containing 10 to 90 parts by weight of an ethylene- α -olefin copolymer of a density in the range of 0.915 to 0.940 g/cm³, and 90 to 10 parts by weight of a hydrogenated styrene-butadiene block copolymer containing 10 to 50% by weight of styrene and 90 to 50% by weight of butadiene.

If the density of the ethylene- α -olefin copolymer is less than 0.915 g/cm³ or greater than 0.940 g/cm³, the film forming ability of the resin composition of the ethylene- α -olefin copolymer and the hydrogenated styrene-butadiene block copolymer for forming the intermediate layer 25 is not satisfactory. If the styrene content of the hydrogenated styrene-butadiene block copolymer is less than 10% by weight, films formed of the resin composition has an excessively high tackiness, are liable to block and are difficult to handle. If the styrene content of the hydrogenated styrene-butadiene block copolymer is greater than 50% by weight, the adhesive strength between the intermediate layer 25 and the heat sealant layer 22 at a low temperature is insufficient. A hydrogenated material makes the intermediate layer 25 flexible, is compatible with the ethylene- α -olefin copolymer and contributes to the enhancement of the transparency of

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TITLE: METHOD OF DISPERSING AN INSOLUBLE MATERIAL IN AQUEOUS SOLUTION AND AGRICULTURAL FORMULATION

PUBN-DATE: April 22, 1999

INVENTOR-INFORMATION:

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☐ 4. Document ID: WO 9918786 A1

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File: EPAB

Apr 22, 1999

PUB-NO: WO009918786A1
DOCUMENT-IDENTIFIER: WO 9918786 A1
TITLE: METHOD AND COMPOSITION FOR DISPERSING AN INSOLUBLE MATERIAL IN AQUEOUS SOLUTION

PUBN-DATE: April 22, 1999

INVENTOR-INFORMATION:

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L5: Entry 5 of 8

File: EPAB

Apr 22, 1999

the intermediate layer 25. The mixing ratio between the ethylene- α -olefin copolymer and the styrene-butadiene block copolymer in the film forming the intermediate layer 25 affect greatly the adhesive strength between a synthetic resin container and the laminated structure (covering structure) 21 heat-sealed to the synthetic resin container, and the transparency of the intermediate layer 25. If the ethylene- α -olefin copolymer content is less than 10% by weight and the hydrogenated styrene-butadiene block copolymer content is greater than 90% by weight, the film forming ability of the resin composition for forming the intermediate layer 25 and the transparency of the covering structure 21 are unsatisfactory. If the ethylene- α -olefin copolymer content is greater than 90% by weight and the hydrogenated styrene-butadiene block copolymer content is less than 10% by weight, the adhesion of the intermediate layer 25 with the heat sealant layer 22 is excessively low, and the adhesive strength between the laminated structure (covering structure) 21 and the synthetic resin container is lower than an appropriate adhesive strength.

The intermediate layer 25 of a single-layer construction may be formed of a linear saturated polyester resin having a glass transition point of 40° C. or above.

Possible linear saturated polyester resins having a glass transition point of 40° C. or above are polymers each produced by the copolycondensation of an alcohol, such as ethylene glycol, propylene glycol, 1,4-butanediol or 1,4-cyclohexane dimethanol, and a fatty dicarboxylic acid, such as adipic acid or sebacic acid, or an aromatic dicarboxylic acid, such as terephthalic acid, isophthalic acid or diphenylcarboxylic acid. More specifically, possible linear saturated polyester resins are polymers produced by the copolycondensation of ethylene glycol and terephthalic acid, ethylene glycol, isophthalic acid and terephthalic acid, 1,4-cyclohexane dimethanol, ethylene glycol and terephthalic acid, and propylene glycol, isophthalic acid and terephthalic acid. A linear saturated polyester resin having a glass transition point of 40° C. is preferred because the temperature of an environment in which the laminated structure (covering structure) 21 will be used is 40° C. or below.

Desirably, the thickness of the intermediate layer 25 of a single-layer construction is in the range of about 3 to about 100 μ m. It is difficult to form the intermediate layer 25 in a thickness below 3 μ m, and it is difficult to heat-seal the laminated structure (covering structure) 21 satisfactorily to a synthetic resin container.

The intermediate layer 25 of a multilayer construction will be described. As shown in FIG. 4, the intermediate layer 25 of a two-layer construction consists of a first resin layer 25a and a second resin layer 25b.

The first resin layer 25a may be formed of an ethylene- α -olefin copolymer of a density in the range of 0.915 to 0.940 g/cm³, or a composition or a resin different from that forming the second resin layer 25b.

The second resin layer 25b may be formed of a resin composition of 100 parts by weight of a resin composition containing 10 to 90% by weight of an ethylene- α -olefin copolymer of a density in the range of 0.915 to 0.940 g/cm³ and 90 to 10% by weight of styrene-butadiene block copolymer of 10 to 50% by weight of styrene and 90 to 50% by weight of butadiene, and 0 to 30 parts by weight of hydrogenated styrene-butadiene block copolymer. The second resin layer 25b may be formed of a resin composition of 100 parts by weight of a resin composition containing 10 to 90% by weight of an ethylene- α -olefin copolymer of a density in the range of 0.915 to 0.940 g/cm³ and 90 to 10% by weight of styrene-butadiene block copolymer of 50 to 90% by

weight of styrene and 50 to 10% by weight of butadiene, and 0 to 50 parts by weight of a high-impact polystyrene. The second resin layer 25b may be formed of a resin composition of 100 parts by weight of a resin composition containing 10 to 90% by weight of an ethylene- α -olefin copolymer of a density in the range of 0.915 to 0.940 g/cm³ and 90 to 10% by weight of styrene-butadiene block copolymer of 50 to 90% by weight of styrene and 50 to 10% by weight of butadiene, 0 to 30 parts by weight of a hydrogenated styrene-butadiene block copolymer of 10 to 50% by weight of styrene and 90 to 50% by weight of butadiene, and 0 to 50 parts by weight of a high-impact polystyrene.

The respective thicknesses of the first resin layer 25a and the second resin layer 25b may be in the range of about 2 to about 60 μ m.

As shown in FIG. 5, the intermediate layer 25 of a three-layer construction consists of a first resin layer 25a, a second resin layer 25b and a third resin layer 25c in contact with the heat sealant layer 22.

The first resin layer 25a may be formed of an ethylene- α -olefin copolymer of a density in the range of 0.915 to 0.940 g/cm³. The second resin layer 25b and the third resin layer 25c are formed of resin compositions of different composition, respectively. The second resin layer 25b may be formed of a resin composition of 100 parts by weight of a resin composition containing 10 to 90% by weight of an ethylene- α -olefin copolymer of a density in the range of 0.915 to 0.940 g/cm³ and 90 to 10% by weight of styrene-butadiene block copolymer of 50 to 90% by weight of styrene and 50 to 10% by weight of butadiene, 0 to 30 parts by weight of a hydrogenated styrene-butadiene block copolymer of 10 to 50% by weight of styrene and 90 to 50% by weight of butadiene, and 0 to 50 parts by weight of a high-impact polystyrene.

The third resin layer 25c may be formed of a resin composition of 100 parts by weight of a resin composition containing 10 to 90% by weight of an ethylene- α -olefin copolymer of a density in the range of 0.915 to 0.940 g/cm³ and 90 to 10% by weight of styrene-butadiene block copolymer of 50 to 90% by weight of styrene and 50 to 10% by weight of butadiene, 0 to 30 parts by weight of a hydrogenated styrene-butadiene block copolymer of 10 to 50% by weight of styrene and 90 to 50% by weight of butadiene. The third resin layer 25c may be formed of a resin composition of 100 parts by weight of a resin composition containing 10 to 90% by weight of an ethylene- α -olefin copolymer of a density in the range of 0.915 to 0.940 g/cm³ and 90 to 10% by weight of styrene-butadiene block copolymer of 50 to 90% by weight of styrene and 50 to 10% by weight of butadiene, 0 to 30 parts by weight of a hydrogenated styrene-butadiene block copolymer of 10 to 50% by weight of styrene and 90 to 50% by weight of butadiene, and 0 to 50 parts by weight of a high-impact polystyrene. It is also possible to form the third resin layer 25c of a resin composition of 100 parts by weight of a resin composition containing 10 to 90% by weight of an ethylene- α -olefin copolymer of a density in the range of 0.915 to 0.940 g/cm³ and 90 to 10% by weight of styrene-butadiene block copolymer of 50 to 90% by weight of styrene and 50 to 10% by weight of butadiene, 0 to 30 parts by weight of a hydrogenated styrene-butadiene block copolymer of 10 to 50% by weight of styrene and 90 to 50% by weight of butadiene, and 0 to 50 parts by weight of a high-impact polystyrene.

The respective thicknesses of the first resin layer 25a, the second resin layer 25b and the third resin layer 25c may be in the range of 3 to 20 μ m. The multilayer intermediate layer 25 may be formed by a dry lamination process or an extrusion lamination process.

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TITLE: METHOD AND COMPOSITION

PUBN-DATE: April 22, 1999

INVENTOR-INFORMATION:

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COUNTRY

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INT-CL (IPC): A01N 25/30; B01F 17/52

Full	Title	Citation	Front	Review	Classification	Date	Reference
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K/MC	Draw Desc	Image
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☐ 6. Document ID: US 5783692 A

L5: Entry 6 of 8

File: EPAB

Jul 21, 1998

PUB-NO: US005783692A
DOCUMENT-IDENTIFIER: US 5783692 A
TITLE: Alkyl polysaccharide derivatives and compositions

PUBN-DATE: July 21, 1998

INVENTOR-INFORMATION:

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INT-CL (IPC): C07H 13/04; C07H 1/00; A61K 31/715; A01N 25/00
EUR-CL (EPC): C11D017/00; C11D001/08

Full	Title	Citation	Front	Review	Classification	Date	Reference
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☐ 7. Document ID: WO 9824313 A1

L5: Entry 7 of 8

File: EPAB

Jun 11, 1998

It is desirable that a covering structure formed by processing the foregoing laminated structure of the present invention, for use in combination with a carrier tape has the following peeling property. It is desirable, when peeling off the laminated structure (covering structure) 21 heat-sealed to a synthetic resin container, that the intermediate layer 25 and the heat sealant layer 22 are separated from each other by delamination or the heat sealant layer 22 breaks internally due to cohesive failure. The peel strength of the laminated structure is lower than the adhesive strength between the heat sealant layer 22 and the antistatic layer 23 or the weld strength between the antistatic layer 23 and the synthetic resin container. Preferably, the peel strength is in the range of 100 to 1200 g/15 mm. If the peel strength is less than 100 g/15 mm, it is possible that the intermediate layer 25 separates from the heat sealant layer 22 during transportation, and the parts contained in the synthetic resin container fall off. If the peel strength is higher than 1200 g/15 mm, it is possible that the synthetic resin container vibrates and the parts contained in the synthetic resin container are shook out of the synthetic resin container when the laminated structure (covering structure) 21 is peeled from the synthetic resin container. Desirably, zip-up is 50 g/2 mm or below. If zip-up is greater than 50 g/2 mm, it is possible that the synthetic resin container vibrates and the parts contained in the synthetic resin container pop out of the synthetic resin container when the covering structure is peeled from the synthetic resin container.

The foregoing peel strength is measured by a peel test in which the laminated structure is peeled off in a 180°-peeling mode at a peeling rate of 300 mm/min in an atmosphere of 23° C. and 40% RH. Zip-up is the difference between a maximum and a minimum peel strength among peel strengths of 2 mm wide strips formed by heat-sealing a 15 mm wide multilayer structure to a synthetic resin container and slitting the laminated structure. The peel strength of the 2 mm wide strips is measured by peeling off the 2 mm wide strips in a 180°-peeling mode at a peeling rate of 300 mm/min in an atmosphere of 23° C. and 40% RH.

A delamination peeling mode using delamination between the intermediate layer 25 and the heat sealant layer 22 or a cohesive failure peeling mode using the internal breakage of the sealant layer 22 due to cohesive failure can optionally be selected by controlling heat-sealing conditions. The delamination peeling mode can be selected if the laminated structure is heat-sealed to the synthetic resin container by using heavy heat-sealing conditions, i.e., a high heating temperature, a long heating time and a high pressure. The cohesive failure peeling mode can be selected if the laminated structure is heat-sealed to the synthetic resin container by using light heat-sealing conditions. When the delamination peeling mode is desired, the heating temperature is in the range of 130 to 200° C., the heating time is in the range of 0.3 to 2.0 sec, and the pressure is in the range of 0.7 to 3.0 kgf/cm². When the cohesive failure peeling is desired, the heating temperature is in the range of 90 to 150° C., the heating time is in the range of 0.1 to 0.5 sec, and the pressure is in the range of 0.3 to 1.2 kgf/cm².

The laminated structure (covering structure) 21 can be heat-sealed to the synthetic resin container by a sufficiently high adhesive strength between the heat sealant layer 22 and the synthetic resin container, and the same can surely be peeled off from the synthetic resin container with a small zip-up.

A pouch can be formed by processing the laminated structure of the present invention by a known pouch forming method so that the antistatic layer of the laminated structure

forms the innermost layer of the pouch. A tear notch is formed in the pouch. When opening the pouch, the pouch is torn from the tear notch. The laminated structure for forming the pouch is not subject to restrictions on peel strength which apply to the laminated structure for forming the covering structure. The oriented resin layer 24 of the laminated structure for forming the pouch may be formed by a uniaxially oriented resin film. The pouch formed from such a laminated structure can easily be torn along the direction of orientation of the uniaxially oriented resin film.

The peeling action of a covering structure 21 formed by processing the laminated structure as shown in FIG. 3 will be described with reference to FIGS. 6 to 9.

Referring to FIGS. 6 and 7, the covering structure 21 as shown in FIG. 3 is heat-sealed to, for example, a carrier tape 31 provided with blisters 32, to form strip-shaped heat-sealed portions H, i.e., shaped portions, of a predetermined width on the opposite sides of the blisters 32. In the covering structure 21, the adhesive strength between the intermediate layer 25 and the heat sealant layer 22 is in the range of 100 to 1200 g/15 mm, which is lower than the adhesive strength between the heat sealant layer 22 and the antistatic layer 23 or the weld strength between the antistatic layer 23 and the carrier tape 31. When peeling the covering structure 21 from the carrier tape 31, portions of the heat sealant layer 22 and the antistatic layer 23 forming the heat-sealed portions H remain welded to the carrier tape 31 and the intermediate layer 25 is delaminated from the heat sealant layer 22 as shown in FIG. 8, so that the covering structure 21 is peeled from the carrier tape 31, leaving the portions of the heat sealant layer 22 and the antistatic layer 23 corresponding to the heat-sealed portions H on the carrier tape 31. In another case, the portions of the heat sealant layer 22 corresponding to the heat-sealed portions H break internally due to cohesive failure, and the covering structure 21 is peeled from the carrier tape 31, leaving part of the portions of the heat sealant layer 22 and the portions of the antistatic layer 23 corresponding to the heat-sealed portions H on the carrier tape 31 as shown in FIG. 9. Thus, the covering structure 21 of the present invention has contradictory characteristics which make the covering structure to be heat-sealed to the carrier tape 31 with a high weld strength and to be easily peeled from the carrier tape 31.

FIGS. 10 and 11 show pouches in accordance with the present invention in typical sectional views, respectively. A pouch 41 shown in FIG. 10 is formed, for example, by putting together two laminated structures 21 similar to that shown in FIG. 3 with the antistatic layers thereof facing each other, and joining together the laminated structures 21 by bonding together the peripheral portions of the laminated structures 21 by heat-sealing or crimping. One of the two laminated structures may be a laminated structure of a construction in accordance with the present invention different from that of the laminated structure 21 shown in FIG. 3 or may be a resin film other than laminated structures in accordance with the present invention. A pouch 51 shown in FIG. 11 is formed, for example, by rolling a laminated structure 21 similar to that shown in FIG. 3 in a cylindrical shape with the antistatic layer forming the innermost layer of the cylindrical shape, and bonding together the overlapping opposite end portions of the laminated structure 21 by heat-sealing or crimping. A tear notch is formed in the pouch. When opening the pouch, the pouch is torn from the tear notch. The laminated structure for forming the pouch is not subject to restrictions on peel strength which apply to the foregoing laminated structure. The oriented resin layer of the laminated structure may be formed by a uniaxially oriented

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TITLE: HERBICIDAL COMPOSITIONS

PUBN-DATE: June 11, 1998

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INT-CL (IPC): A01N 25/30; A01N 57/20; C11D 1/825
EUR-CL (EPC): A01N057/20

Full	Title	Citation	Front	Review	Classification	Date	Reference
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☐ 8. Document ID: WO 9620203 A1

L5: Entry 8 of 8

File: EPAB

Jul 4, 1996

PUB-NO: WO009620203A1
DOCUMENT-IDENTIFIER: WO 9620203 A1
TITLE: ALKYL POLYSACCHARIDE DERIVATIVES AND COMPOSITIONS

PUBN-DATE: July 4, 1996

INVENTOR-INFORMATION:

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INT-CL (IPC): C07H 15/04; C08B 37/00; A01N 25/30; C11D 1/04; C09G 1/18
EUR-CL (EPC): C11D001/08; C07H015/04, A01N025/30, A01N043/16, C11D001/04,
D06M013/148, D06M013/224, D06M015/03, C08B037/00

Full	Title	Citation	Front	Review	Classification	Date	Reference
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KWIC	Draw Desc	Clip Img	Image
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resin film. The pouch formed from such a laminated structure can easily be torn along the direction of orientation of the uniaxially oriented resin film. The pouch may be opened by tearing the laminated structures or by peeling the two laminated structures from each other. When opening the pouch by peeling the laminated structures from each other, the laminated structures may be separated from each other along the interface between the bonded laminated structures.

The multilayer structure of the present invention may be provided with an antireflection film, or an antireflection film and an antistatic layer on the oriented resin layer. FIGS. 12 and 13 show such laminated structures in further embodiments according to the present invention. Referring to FIG. 12, a laminated structure 61 comprises an oriented resin layer 64, an adhesive layer 66 formed on one of the surfaces of the oriented resin layer 64, an intermediate layer 65 laminated to the oriented resin layer 64 with the adhesive layer 66, a heat sealant layer 62 laminated to the intermediate layer 65, an antistatic layer 63 laminated to the heat sealant layer 62, and an antireflection film 67 laminated to the other surface of the oriented resin layer 64. A laminated structure 61 shown in FIG. 13 is similar to that shown in FIG. 12, except that the former is provided with an antistatic layer 68 sandwiched between an oriented resin layer 64 and an antireflection film 67.

The antireflection film 67 suppresses the irregular reflection of light by the laminated structure and the reflection of an image of a light source on the laminated structure, and facilitates the visual recognition of the interior of a container. The antireflection film 67 may be formed by spreading an ink prepared by dispersing one or more than one of calcium fluoride, sodium fluoride, lithium fluoride, magnesium fluoride, lanthanum fluoride, neodymium fluoride, cerium fluoride, silicon dioxide, aluminum oxide, magnesium oxide, thorium oxide, lanthanum oxide, silicon monoxide, yttrium oxide, zirconium oxide, titanium oxide, cerium oxide, zinc oxide, bismuth oxide and cadmium oxide in a thermoplastic resin. The thermoplastic resin may be any one of polyester resins, polyurethane resins, acrylic resins, vinyl chloride-vinyl acetate copolymers, polyvinyl acetate resins, phenolic resins, xylene resins, urea resins, melanin resins, ketone resins, coumaron-indene resins, petroleum resins, terpene resins, cyclopolymeric rubbers, chlorinated rubbers, alkyd resins, polyamide resins, polyvinyl alcohol resins, polyvinyl butyral resins, chlorinated polypropylene resins, styrene resins, epoxy resins and cellulose derivatives. Methods for forming the antireflection film 67 by spreading an ink are an air-doctor-coating method, a blade-coating method, a knife-coating method, a rod-coating method, a roll-coating method, a gravure coating method, a screen-coating method, a kiss-roll-coating method, a bead-coating method, a slot-orifice-coating method and a spray coating method. Suitable method for directly forming the antireflection film 67 are a vacuum evaporation methods, a sputtering method and the like. The antireflection film 67 may be of either a single-layer construction or a multilayer construction. A desirable thickness of the antireflection film 67 is in the range of 0.01 to 0.5 μm .

The laminated structure 61 is provided with the antistatic layer 68 to prevent the attraction of dust to the surface thereof by static electricity. Antistatic agent contained in the antistatic layer 68 is a conductive metal oxide powder, such as lead oxide powder, indium oxide powder or zinc oxide powder, of a particle size in the range of 0.01 to 1 μm , conductive carbon, a surface active agent or a bisammonium organic sulfur semiconductor. More specifically, the antistatic layer 68 may contain any one of the following antistatic agents.

(1) Particles of conductive carbon including those of kitchen black, acetylene black and furnace black, having a particle size in the range of 20 to 150 μm and a surface area of 60 m^2/g or above

(2) Particles of metal oxides including lead oxide, indium oxide and zinc oxide, particles of metal sulfides or conductive substances obtained by making metal sulfates conductive by doping or the like, having a particle size in the range of 0.01 to 1 μm

(3) Particles of metals including copper, iron, aluminum, nickel and gold, having a particle size in the range of 0.01 to 10 μm or fine powders containing a fibrous metal as a principal component

(4) Anionic, cationic, nonionic and amphoteric surface active agents Suitable anionic surface active agents are sulfated oils, soaps, sulfated ester oils, sulfated amide oils, olefin sulfates, fatty alcohol sulfates, alkylsulfates, fatty acid ethyl sulfonates, alkyl sulfonates, alkylbenzene sulfonate, a mixture of naphthalene sulfonic acid and formalin, succinic ester sulfonate and phosphates.

Suitable cationic surface active agents are primary amines, tertiary amines, quaternary ammonium compounds and pyridine derivatives.

Suitable nonionic surface active agents are partial fatty acid esters of polyhydric alcohols, ethylene oxide adducts of fatty alcohols, ethylene oxide adducts of fatty acids, ethylene oxide adducts of fatty amines or fatty acid amides, ethylene adducts of alkylphenols, ethylene oxide adducts of alkylphenol and ethylene oxide adducts of partial fatty acid esters of polyhydric alcohols.

Suitable amphoteric surface active agents are carboxylic acid derivatives and imidazoline derivatives.

(5) Fatty acid derivatives, partial hydrolysates of four-functional-group silicon, bisammonium organic sulfur semiconductors.

The antistatic layer 68 may be formed by spreading any one of the foregoing antistatic agents over the oriented resin layer 64. The antistatic layer 68 may be formed by applying an ink prepared by dispersing the antistatic agent in a thermoplastic resin suitable for forming the antireflection film 67. Preferably, the thickness of the antistatic layer 68 is in the range of 0.2 to 20 μm .

The surface resistivity of the antistatic layer 68 in an atmosphere of 22° C. and 90% RH is in the range of 10^5 to $10^{12} \Omega$, and a static decay time of 2 sec or below necessary for reducing a charge of 5000 V by 99% at 23±5° C. and 12±3% RH. The antistatic layer 68 provides an excellent antistatic effect.

The oriented resin layer 64, the adhesive layer 66, the intermediate layer 65, the heat sealant layer 62 and the antistatic layer 63 of the laminated structure 61 of FIG. 13 are the same as those of the laminated structure 61 of FIG. 12, respectively, and hence the description thereof will be omitted.

If a covering structure and a pouch formed by processing the laminated structure of the present invention need gas shielding for shutting out steam and gases, such as oxygen gas, carbon dioxide gas and nitrogen gas, and electric shielding for avoiding external electrical influence on the contents to protect the contents, the covering structure may be provided, in addition to the intermediate layer, with two or more additional layers meeting desired purposes between the oriented resin layer and the heat sealant layer.

A laminated structure as an example of such laminated structure is provided with an inorganic layer 26a of a metal foil or an evaporated inorganic film, and an adhesive layer 26 between the oriented resin layer 24 and the heat sealant

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Search Results - Record(s) 1 through 3 of 3 returned.☐ 1. Document ID: WO 9918787 A1

L7: Entry 1 of 3

File: EPAB

Apr 22, 1999

PUB-NO: WO009918787A1

DOCUMENT-IDENTIFIER: WO 9918787 A1

TITLE: METHOD OF DISPERSING AN INSOLUBLE MATERIAL IN AQUEOUS SOLUTION AND AGRICULTURAL FORMULATION

PUBN-DATE: April 22, 1999

INVENTOR-INFORMATION:

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Full	Title	Citation	Front	Review	Classification	Date	Reference
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☐ 2. Document ID: WO 9918786 A1

L7: Entry 2 of 3

File: EPAB

Apr 22, 1999

PUB-NO: WO009918786A1

DOCUMENT-IDENTIFIER: WO 9918786 A1

TITLE: METHOD AND COMPOSITION FOR DISPERSING AN INSOLUBLE MATERIAL IN AQUEOUS SOLUTION

PUBN-DATE: April 22, 1999

INVENTOR-INFORMATION:

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INT-CL (IPC): A01N 25/30; B01F 17/52

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Full	Title	Citation	Front	Review	Classification	Date	Reference
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weight of the thermoplastic resin. The primary particle size of the inorganic particles, the organic particles or the organic spherical beads is in the range of about 0.001 to about 200 μm , preferably, in the range of about 0.01 to about 10 μm . The inorganic particles, the organic particles or the organic spherical beads contained in the heat sealant layer reduces the expansion and contraction of the thermoplastic resin caused by heat and pressure applied thereto during heat-sealing, and reduces residual stress remaining in the thermoplastic resin forming the heat sealant layer. The strength (particularly, shearing strength and tensile elongation) of the heat sealant layer containing the particles is lower than that of a heat sealant layer formed only of the thermoplastic resin, and it is expected that the heat sealant layer, when heat-sealed, has a low adhesion and reduces zip-up.

The inorganic particles may be one or more of SiO_2 , Al_2O_3 , TiO_2 , Fe_2O_3 , ZnO , SnO_2 , CeO_2 , NiO , PbO , S_2Cl_2 , SnCl_2 , ZnCl_2 , FeCl_2 , CaCO_3 , MgCO_3 , B_2O_3 , hydrous silicic anhydride, hydrous calcium silicate, hydrous aluminum silicate, aluminum silicate, magnesium silicate, calcium silicate, barium sulfate, lead sulfate, strontium sulfate and aluminum hydroxide. The organic particles and the organic beads may be one or more than one of acrylic resins, polyolefin resins, polystyrene resins and polyester resins.

(4) Heat Sealant layer 2

The heat sealant layer 2 of the laminated structure (covering structure) 1 of the present invention may be the same one as that of the first embodiment.

The rigidity, the Young's modulus and the stiffness of the heat sealant layer 2 can be enhanced by adding a hardener capable of being used for forming the adhesive layer 6 to a thermoplastic resin forming the heat sealant layer 2. A desirable hardener content of the thermoplastic resin is in the range of 0.5 to 30% by weight. The addition of such a hardener to the heat sealant layer 2 improves the heat resistance of the heat sealant layer 2 and provides the heat sealant layer 2 with an antiblocking property.

The thickness of the heat sealant layer 2 is in the range of 0.1 to 60 μm , preferably, in the range of 0.5 to 30 μm . It is difficult to form the heat sealant layer 2 in a thickness less than 0.1 μm . If the thickness of the heat sealant layer 2 is greater than 60 μm , the laminated structure is excessively thick, excessively firm and difficult to handle, increases the amount of heat necessary for heat-sealing a covering structure formed by processing the laminated structure, makes high-speed heat-sealing impossible, and reduces productivity.

The heat sealant layer 2 may be a film attached to the intermediate layer 5 or may be formed by applying a molten material or a solution prepared by dissolving a material in a solvent to the intermediate layer 5.

FIG. 16 is a typical sectional view of a laminated structure in a modification of the laminated structure of FIG. 14. Referring to FIG. 16, a laminated structure 11 is fabricated by sequentially stacking a multilayer heat-resistant base layer 14, an adhesive layer 16, an intermediate layer 5 and a heat sealant layer 2 in that order. In this laminated structure (covering structure) 11, the multilayer heat-resistant base layer 14 is constructed by laminating a first heat-resistant layer 14a, a second heat-resistant layer 14b and an additional adhesive layer 19. This multilayer structure of heat-resistant resin layers provides the laminated structure (covering structure) 11 with a high stiffness. The heat-resistant base layer 14 may be a multilayer film formed by laminating two or more resin films similar to the resin film forming the heat-resistant base layer 4 of the foregoing laminated structure (covering structure) 1 with an adhesive or a multilayer

film formed by coextrusion. The component layers of the heat-resistant base layer 14 may be the same resin films or different resin films. A desirable thickness of each component layer of the multilayer heat-resistant base layer 14 is in the range of about 3 to about 35 μm , and the thickness of the multilayer heat-resistant base layer 14 may be in the range of about 12 to about 50 μm . The additional adhesive layer 19 for laminating the films to construct the multilayer film may be the same adhesive as that forming the adhesive layer 6 of the foregoing laminated structure (covering structure) 1.

The adhesive layer 6, the intermediate layer 5 and the heat sealant layer 2 of the laminated structure (covering structure) 11 can be formed by the same methods as those of forming the adhesive layer 6, the intermediate layer 5 and the heat sealant layer 2 of the laminated structure (covering structure) 1, and hence the description thereof will be omitted.

An antistatic property may be given to the laminated structure and the covering structure of the present invention by any one of the following methods.

A method ① which forms the heat sealant layer of a material containing an antistatic agent, such as a metal oxide having electric conductivity, carbon or a surface active agent, a method ② which coats a surface of the heat sealant layer opposite the surface the same contiguous with the intermediate layer with an antistatic layer of a metal oxide having electric conductivity, carbon or a surface active agent and a method ③ which adds an antistatic agent, such as a metal oxide having electric conductivity, carbon or a surface active agent, to at least one of the heat-resistant base layer, the adhesive layer and the intermediate layer.

Possible antistatic agents are conductive powders of a particle size in the range of 0.01 to 1 μm of metal oxides, such as lead oxide, indium oxide and zinc oxide, having electric conductivity, conductive carbon, surface active agents and bisammonium organic sulfur semiconductors.

More specifically, the following antistatic agents may be used.

(1) Conductive carbon including kitchen black, acetylene black and furnace black, having a particle size in the range of 20 to 150 μm and a surface area of 60 m^2/g or above

(2) Conductive powders of metal oxides including lead oxide, indium oxide and zinc oxide, metal sulfides or conductive substances obtained by making metal sulfates conductive by doping or the like, having a particle size in the range of 0.01 to 1 μm

(3) Particles of metals including copper, iron, aluminum, nickel and gold, having a particle size in the range of 0.01 to 10 μm or fine powders containing a fibrous metal as a principal component

(4) Anionic, cationic, nonionic and amphoteric surface active agents

Suitable anionic surface active agents are sulfated oils, soaps, sulfated ester oils, sulfated amide oils, olefin sulfates, fatty alcohol sulfates, alkylsulfates, fatty acid ethyl sulfonates, alkyl sulfonates, alkylbenzene sulfonates, a mixture of naphthalene sulfonic acid and formalin, succinic ester sulfonate and phosphates.

Suitable cationic surface active agents are primary amines, tertiary amines, quaternary ammonium compounds and pyridine derivatives.

Suitable nonionic surface active agents are partial fatty acid esters of polyhydric alcohols, ethylene oxide adducts of fatty alcohols, ethylene oxide adducts of fatty acids, ethylene oxide adducts of fatty amines or fatty acid amides, ethylene adducts of alkylphenols, ethylene oxide adducts of alkylphenols and ethylene oxide adducts of partial fatty acid esters of polyhydric alcohols.

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L7: Entry 3 of 3

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TITLE: METHOD AND COMPOSITION

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INT-CL (IPC): A01N 25/30; B01F 17/52

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Full	Title	Citation	Front	Review	Classification	Date	Reference
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Term	Documents
TUDOR.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	3236
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PHILLIP.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	13673
PHILLIPS.DWPI,TDBD,EPAB,JPAB,USPT,PGPB.	74084
ROBERT[DWPI,EPAB,JPAB,USPT,PGPB]	612492
ROBERTS[DWPI,EPAB,JPAB,USPT,PGPB]	55446
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United States Patent [19]

[11] Patent Number: 4,937,276
[45] Date of Patent: Jun. 26, 1990

[54] GLASS-FIBER-REINFORCED STABILIZED POLYAMIDE MOLDING COMPOSITIONS

[75] Inventors: Werner Nielsing, Krefeld;
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[21] Appl. No.: 191,905

[22] Filed: May 9, 1988

[30] Foreign Application Priority Data
May 22, 1987 [DE] Fed. Rep. of Germany 3717218

[51] Int. Cl. C08K 5/50; C08K 5/524
[52] U.S. Cl. 524/136; 524/139;
524/607; 524/154
[58] Field of Search 524/139, 136, 607, 154

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Primary Examiner—Lewis T. Jacobs

Attorney, Agent, or Firm—Connolly and Hutz

[57] ABSTRACT

Improved polyamide molding compositions are charac-

terized in that
(a) the polyamide essentially contains the polycon-

densation product of adipic acid, terephthalic acid
and hexamethylenediamine,

(b) the molding compositions are reinforced with
glass fibers and

(c) a mixture of copper-, halogen- and phosphorus-
containing compounds is present as stabilizer.

9 Claims, No Drawings

leaf 3-16-1988

<u>DB Name</u>	<u>Query</u>	<u>Hit Count</u>	<u>Set Name</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near13 maleic anhydride near13 methylene cyclohexane	0	<u>L14</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near3 maleic anhydride near3 methylene cyclohexane	0	<u>L13</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near3 maleic anhydride near3 ethylidene norbornene	0	<u>L12</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near3 maleic anhydride near3 ethylidene\$1norbornene	0	<u>L11</u>
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USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near maleic anhydride near pinene	0	<u>L9</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near5 maleic anhydride near5 pinene	4	<u>L8</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near5 maleic anhydride near5 methylene cyclopentane	0	<u>L7</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near5 maleic anhydride near5 methylene cyclopentene	0	<u>L6</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near maleic anhydride near methylene cyclopentene	0	<u>L5</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer and maleic anhydride and methylene cyclopentene [clm]	0	<u>L4</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer and maleic anhydride and methylene cyclopentene [ab]	0	<u>L3</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer and maleic anhydride and methylene cyclopentene [ti]	0	<u>L2</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer and maleic anhydride and methylene cyclopentene	6	<u>L1</u>

09/529480

11 Jan 97

MAIDIR97

Last Name	First Names	City	State	Phone	96 Dues	97 Dues	98 Dues	Collect	97 Rec'd
Adarkar	Arun	Washington	DC	(202)625-1417	\$20.00	\$0.00	\$0.00	\$150.00	
Kulkarni	Vijay & Chhaya	Annapolis	MD	(410)224-3123	\$0.00	\$0.00	\$0.00	\$250.00	
Dhond	Dinar & Pallavi	Arnold	MD	(410)349-0878	\$35.00	\$0.00	\$0.00	\$250.00	
Kulkarni	Durgadas & Sanjeevani	Bail	MD	(410)788-2266	\$35.00	\$35.00	\$0.00	\$215.00	
Kamat	Nitin & Sonal	Baltimore	MD	(410)602-1875	\$25.00	\$25.00	\$0.00	\$225.00	
Mokade	Pratulla V.	Baltimore	MD		\$35.00	\$0.00	\$0.00	\$250.00	
Kamat	Gopal & Priya	Baltimore	MD	(410)367-4049	\$35.00	\$0.00	\$0.00	\$250.00	
Kurita	Ashok & Jyoti	Baltimore	MD	(410)256-3248	\$0.00	\$0.00	\$0.00	\$250.00	
Pathak	Ambadas & Radha	Baltimore	MD	(410)235-3874	\$0.00	\$0.00	\$0.00	\$250.00	
Kamat	C.R.V. and Sudha	Bel Air	MD	(410)836-7355	\$10.00	\$0.00	\$0.00	\$250.00	
Kavishwar	Ashok & Hariastuti	Bethesda	MD		\$0.00	\$0.00	\$0.00	\$250.00	
Tuljapurkar	Vivek & Ojaswini	Bethesda	MD	(301)530-5731	\$51.00	\$0.00	\$0.00	\$350.00	
Abhyankar	Ashok & Shobha	Bethesda	MD	(301)654-8810	\$43.00	\$0.00	\$0.00	\$0.00	
Barve	Prabhakar & Neera	Bethesda	MD	(301)229-3908	\$35.00	\$0.00	\$0.00	\$250.00	
Barve	Anand & Anagha	Bethesda	MD	(301)530-9326	\$25.00	\$35.00	\$0.00	\$215.00	
Deshpande	Ramesh & Pushpa	Bethesda	MD	(301)229-7848	\$0.00	\$0.00	\$0.00	\$250.00	
Dighe	Shrikant & Judith	Bethesda	MD	(301)493-8867	\$35.00	\$0.00	\$0.00	\$250.00	
Joglekar	Hemant & Malini	Bethesda	MD	(301)469-6723	\$35.00	\$0.00	\$0.00	\$250.00	
Karmarkar	Vasant & Leela	Bethesda	MD	(301)229-4113	\$0.00	\$0.00	\$0.00	\$250.00	
Mahurkar	Anup	Bethesda	MD	(301)986-4869	\$43.00	\$0.00	\$0.00	\$250.00	
Mhatre	Ramakant & Nirmala	Bethesda	MD	(301)530-3709	\$35.00	\$30.00	\$0.00	\$190.00	
Shorey	Kashinath & Kumud	Bethesda	MD	(301)530-6348	\$17.50	\$0.00	\$0.00	\$250.00	
Ambardekar	Parag & Shubhangi	Bowie	MD	(301)262-0480	\$0.00	\$0.00	\$0.00	\$250.00	
Apte	Jay & Priya	Bowie	MD	(301)262-5360	\$43.00	\$0.00	\$0.00	\$250.00	
Gondhalekar	Shridhar & Smita	Bowie	MD	(301)262-2721	\$0.00	\$0.00	\$0.00	\$250.00	
Tamaskar	Ravi & Ujjwala	Brookeville	MD	(301)570-4771	\$35.00	\$0.00	\$0.00	\$250.00	
Sharma	Amar & Anasuya	Brookmont	MD	(301)320-3815	\$20.00	\$0.00	\$0.00	\$250.00	
Agashe	Mukund & Pradnya	Burtonsville	MD	(301)598-6759	\$35.00	\$0.00	\$0.00	\$250.00	
Patil	Vijaya	Burtonsville	MD	(301)384-4375	\$0.00	\$35.00	\$0.00	\$215.00	
Tipnis	Abhijit	Catonsville	MD	(410)455-0568	\$0.00	\$0.00	\$0.00	\$250.00	
Joshi	Bhagwan & Smita	Catonsville	MD	(410)788-8813	\$0.00	\$0.00	\$0.00	\$250.00	
Bhagwat	Avinash	Chavy Chase	MD	(301)903-2853	\$35.00	\$0.00	\$0.00	\$250.00	
Dandekar	Vivek & Swati	Cockeysville	MD	(410)667-6053	\$0.00	\$0.00	\$0.00	\$250.00	
Dhote	Anli M.	College Park	MD	(301)982-5509	\$0.00	\$0.00	\$0.00	\$250.00	
Patankar	Shekhar	College Park	MD	(301)345-2883	\$35.00	\$0.00	\$0.00	\$250.00	
Ranade	Yogi	College Park	MD	(301)474-8702	\$0.00	\$0.00	\$0.00	\$250.00	
Tatake	Sachin	College Park	MD	(301)220-4106	\$0.00	\$0.00	\$0.00	\$250.00	
Ambekar	Sunil & Jyotsna	Columbia	MD	(410)997-6853	\$43.00	\$0.00	\$0.00	\$250.00	
Gupte	Alay & Minal	Columbia	MD		\$17.50	\$0.00	\$0.00	\$250.00	
Koranne	Manoj & Anjali	Columbia	MD	(410)730-8588	\$35.00	\$0.00	\$0.00	\$250.00	
Bagal	Arun & Savita	Columbia	MD	(301)490-5933	\$0.00	\$0.00	\$0.00	\$250.00	
Chande	Alhad & Karen	Columbia	MD	(410)740-7411	\$20.00	\$0.00	\$0.00	\$150.00	
Chitale	Ashwini	Columbia	MD	(410)740-1241	\$43.00	\$0.00	\$0.00	\$300.00	
Dharmadhikari	Sudhir & Alaka	Columbia	MD	(410)964-5708	\$0.00	\$0.00	\$0.00	\$250.00	
Karnik	Pankal & Sujata	Columbia	MD	(301)596-1473	\$35.00	\$0.00	\$0.00	\$250.00	

<u>DB Name</u>	<u>Query</u>	<u>Hit Count</u>	<u>Set Name</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near13 maleic anhydride near13 methylene cyclohexane	0	<u>L14</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near3 maleic anhydride near3 methylene cyclohexane	0	<u>L13</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near3 maleic anhydride near3 ethylidene norbornene	0	<u>L12</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near3 maleic anhydride near3 ethylidene\$1norbornene	0	<u>L11</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near3 maleic anhydride near3 pinene	0	<u>L10</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near maleic anhydride near pinene	0	<u>L9</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near5 maleic anhydride near5 pinene	4	<u>L8</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near5 maleic anhydride near5 methylene cyclopentane	0	<u>L7</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near5 maleic anhydride near5 methylene cyclopentene	0	<u>L6</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near maleic anhydride near methylene cyclopentene	0	<u>L5</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer and maleic anhydride and methylene cyclopentene [clm]	0	<u>L4</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer and maleic anhydride and methylene cyclopentene [ab]	0	<u>L3</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer and maleic anhydride and methylene cyclopentene [ti]	0 /	<u>L2</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer and maleic anhydride and methylene cyclopentene	6	<u>L1</u>

Art Unit: 1711

Any inquiry concerning this communication or earlier communications from the examiner should be directed to U.K. Rajguru whose telephone number is (703) 308-3224. The examiner can normally be reached on Monday--Friday from 9:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jim Seidleck, can be reached on (703) 308-2462. The fax phone number for the

organization where this application or proceeding is assigned is (703) 305-3599.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is (703) 308-0661.

U.K. Rajguru/ns

July 1, 2000

<u>DB Name</u>	<u>Query</u>	<u>Hit Count</u>	<u>Set Name</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	Parris, David Hayshiv [in]	3	<u>L8</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	Tudor, Phillip Robert [in]	3	<u>L7</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	Parr, Rodney Walter [in]	7	<u>L6</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	Kirby, Andrew Francis [in]	8	<u>L5</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near3 maleic anhydride near3 methylene cyclopentane	0	<u>L4</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near3 maleic anhydride near3 methylene cyclopentene	0	<u>L3</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near3 maleic anhydride near3 methyl cyclopentene	0	<u>L2</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	copolymer near maleic anhydride near methyl cyclopentene	0	<u>L1</u>

TABLE 1-4-continued

Laminated structure	Construction	Oriented resin film	Intermediate layer	Heat sealant layer	Antistatic layer
Sample 5	②	PET	40% L.LDPE, 50% S.B copolymer, 10% hydrogenated S.B copolymer	Polyester I	Provided
Sample 6	②	PET	40% L.LDPE, 40% S.B copolymer, 10% Hydrogenated S.B copolymer, 10% HIPS	Polyester II	Provided
Sample 7	②	PET	40% L.LDPE, 60% Hydrogenated S.B copolymer	Polyester II	Provided
Sample 8	②	PET	Saturated polyester	Polyurethane	Provided
Sample 9	②	PET	40% L.LDPE, 60% S.B copolymer	Hot-melt adhesive (EVA)	Provided
Sample 10	②	PET	LDPE	EVA group	Provided
Sample 11	②	PET	LDPE	Ionomer	Provided
Sample 12	③	PET	Ethylene-vinyl alcohol copolymer Soap	EVA group*	Provided
Sample 13	③	PET	Aluminum foil	EVA group*	Provided
Sample 14	③	PET	Evaporated silicon dioxide layer Polyvinyl alcohol	LDEP*	Provided
Sample 15	③	PET	Styrene-isoprene block copolymer Elastomer	LDEP*	Provided
Sample 16	②	PET	40% L.LDPE, 60% S.B copolymer	Polyester II	Provided**
Comp. sample 1	④	PET	40% L.LDPE, 60% S.B copolymer	Polyester I	Not provided
Comp. sample 2	④	PET	40% L.LDPE, 60% S.B copolymer	Polyester I with dispersed carbon	Not provided
Comp. sample 3	④	PET	40% L.LDPE, 60% S.B copolymer	Polyester I	Antistatic surface active agent

*: Laminated film Layers of EVA group and ionomer are formed by extrusion and those of others are formed by coating.

** : Mixture of 60% of bisammonium conductor and 40% of polyester II

The haze, total light transmissivity, surface resistivity and static decay time of laminated structures in Samples 1 to 16 and Comparative samples 1 to 3 were measured under the following conditions.

Covering structures were formed by processing the laminated structures in Samples 4 to 10, and the covering structures were heat-sealed to PVC carrier tapes formed by processing a conductive polyvinyl chloride resin sheet ("XEG47" commercially available from Taihei Kagaku K.K.). The covering structures were heat-sealed to the PVC carrier tapes with a heat-sealing bar by a heat-sealing mode 1 (150° C., 0.5 sec, 3.0 kgf/cm²) and a heat-sealing mode 2 (130° C., 0.2 sec, 1.0 kgf/cm²), and adhesive strength were measured by peel tests under the following measuring conditions. Laminated structures in Samples 1 to 3 and 11 to 16 were heat-sealed with a heat-sealing bar by the heat-sealing mode 1 to the flanges of 50 mm diameter, 50 mm high cylindrical cups formed by processing a sheet of a resin of a 50:50 mixture of the polypropylene and the LDPE, and

adhesive strength was measured by peel tests under the following conditions.

Conditions for Measuring Haze and Total Light Transmissivity

"Color computer SM-5SC" (Sug Shikenki K.K.)

Conditions for Measuring Surface Resistivity

"HAIRESTA IP" (Mitsubishi Yuka K.K.), 22° C., 40%

RH

Conditions for Measuring Charge Attenuating Time

"STATIC DECAY METER-406C" (ETS (Electro-Tech Systems) Inc.), 23±5° C., 12±3% RH, 99% decay from 5000 V. Measurement was carried out by a method specified in MIL-B-81705C.

Conditions for Measuring Adhesive Strength

"Tenhiron Banno Shikenki HTH-100" (Toyo Baldwin K.K.), 23° C., 40% RH, peel rate: 300 mm/min, 180°-peeling mode

Measured results and modes of peeling of the laminated structures are tabulated in Table 1-5

TABLE 1-5

Laminated structure	Light Surface Static				Heat sealant layer containing alumina					
	Haze (%)	transmissivity (%)	surface resistivity (Ω)	Static decay time (sec)	Heat sealant layer containing silica			Peel		
					Peel strength (g/15 mm)	Peeling mode Condition 1	Peeling mode Condition 2	strength (g/15 mm)	Peeling mode Condition 1	Peeling mode Condition 2
Sample 1	30	80	10 ⁷	0.1	1200	Cohesive failure	—	1100	Cohesive failure	—
Sample 2	35	78	10 ⁷	0.1	1500	Cohesive failure	—	1300	Cohesive failure	—
Sample 3	30	82	10 ⁷	0.1	1200	Cohesive failure	—	1100	Cohesive failure	—
Sample 4	25	85	10 ⁷	0.1	600	Delamination	Cohesive failure	500	Delamination	Cohesive failure
Sample 5	26	84	10 ⁷	0.1	650	Delamination	Cohesive failure	350	Delamination	Cohesive failure
Sample 6	28	80	10 ⁷	0.1	650	Delamination	Cohesive failure	600	Delamination	Cohesive failure
Sample 7	25	85	10 ⁷	0.1	600	Delamination	Cohesive failure	500	Delamination	Cohesive failure
Sample 8	15	85	10 ⁷	0.1	500	Delamination	Cohesive failure	500	Delamination	Cohesive failure
Sample 9	34	78	10 ⁷	0.1	400	Delamination	Cohesive failure	300	Delamination	Cohesive failure
Sample 10	10	90	10 ⁷	0.1	600	Cohesive failure	Cohesive failure	500	Cohesive failure	Cohesive failure
Sample 11	12	88	10 ⁷	0.1	1500	Cohesive failure	—	1300	Cohesive failure	—
Sample 12	15	85	10 ⁷	0.1	600	Cohesive failure	—	500	Cohesive failure	—
Sample 13	—	—	10 ⁷	0.1	600	Cohesive failure	—	500	Cohesive failure	—
Sample 14	10	92	10 ⁷	0.1	1500	Cohesive failure	—	1300	Cohesive failure	—
Sample 15	10	90	10 ⁷	0.1	1500	Cohesive failure	—	1300	Cohesive failure	—